

<p align="center">15 AUDIO DUPLICATION/ COPYING</p>	<p align="center">Page 1 of 3</p>
<p align="center">Department of Forensic Science Digital Evidence Procedures Manual</p>	<p align="center">Amendment Designator:</p>
	<p align="center">Effective Date: 22-January-2008</p>
<p align="center">15 AUDIO DUPLICATION/ COPYING</p> <p>15.1 Purpose</p> <p>This procedure is utilized in order to produce a direct copy, or working copy of an audio recording. The duplication of recordings may involve duplication to an identical format or may involve format conversions.</p> <p>15.2 Scope</p> <p>This procedure applies to audio recordings that have undergone preliminary examination and any necessary repairs and will undergo further examination.</p> <p>15.3 Materials - Equipment (Hardware/Software)</p> <ul style="list-style-type: none"> • Playback device - The playback device is selected by the examiner, based on the submission requirements. • Recording device - The recording device is determined by the examiner, based on the submission requirements. • Applicable software (as determined by examiner) which may include, but not limited to, any or all of the following: Sound Forge, Adobe Audition, PCAP, Cardinal or other similar software. <p>15.4 Limitations</p> <p>None for this procedure</p> <p>15.5 Safety</p> <p>None for this procedure</p> <p>15.6 Procedures</p> <p>15.6.1 Conduct preliminary examinations.</p> <p>15.6.2 Conduct magnetic tape repair/reconstruction as needed.</p> <p>15.6.3 Optimize playback</p> <p>15.6.4 Determine the area of interest to be reproduced.</p> <p>15.6.5 Analog to Analog duplication:</p> <p>15.6.5.1 Using the appropriate cables, connect the output of the playback device to the input of the recording device(s). Insert the original recording into the playback device and blank media into the recording device.</p> <p>15.6.5.2 Optimize amplitude input levels on the recording device(s), as needed, prior to recording.</p> <p>15.6.5.3 Begin the recording process and periodically monitor utilizing headphones connected to the recording device.</p>	

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<p>15.6.6 Analog to Digital conversion:</p> <p>15.6.6.1 Utilizing the appropriate cables connects the output of the playback device to the input of the computer workstation. Insert the recording into the recording device.</p> <p>15.6.6.2 Optimize amplitude input levels on recording device(s), as needed, prior to recording.</p> <p>15.6.6.3 On the workstation, set the conversion according to the parameters of the audio recording to be processed. Note: .wav file ensures loss-less conversion.</p> <p>15.6.7 Digital to Digital copying:</p> <p>15.6.7.1 Utilizing the appropriate cables, connect the output of the digital playback device or computer workstation on the input of the recording device(s).</p> <p>15.6.7.2 If producing a copy from one digital media to another digital media of to a recording device, follow that manufacturer's instructions to ensure accurate representation of the audio signals.</p> <p>15.6.7.3 If copying from computer workstation to a recording device(s), select appropriate parameters per the submission request. If a compact disc is requested, the sampling rate and other parameters are selected as determined by the examiner without sacrificing quality.</p> <p>15.6.7.4 Begin the transfer/download data process.</p> <p>15.6.8 Copies should be clearly labeled and marked as required by the Quality Manual.</p> <p>15.6.9 Verify adequate recording process of all copies produced.</p> <p>15.6.10 Document all steps of the process in the case file notes.</p> <p>15.6.11 The evidence will be received in accordance with the Department's evidence handling procedures (see Section 20 in the Quality Manual).</p> <p>15.6.12 The equipment to be utilized will be selected based on the type of evidence to be compared.</p> <p>15.6.13 The object or person of interest in an unknown image will be compared with a known image of the suspected object or person. This may be a side by side comparison of printed media, an overlay of images on a computer or a variation of theses techniques. Individualized characteristics may be used to effect or exclude identification; however, due to the nature of the evidence and the limitations of technology, the examination may prove to be inconclusive.</p> <p>15.6.14 The proper documentation will be retained in accordance with the Department's documentation procedures (see Section 13.8 of the Quality Manual).</p> <p>15.7 References</p> <p>Further instruction on specific use of audio equipment can be found in the Owner's Manual and User's Guide for each specific piece of equipment.</p> <p>Ballou, Glen M., ed. <u>Handbook for Sound Engineers the New Audio Cyclopedia</u>. 2nd ed. Carmel, IN: SAMS, 1987.</p> <p>Koenig, Bruce E. "Authentication of Forensic Recordings" Journal of the Audio Engineering society, Vol. 36, No. 36, No. 1/2, 1990 January/February.</p>	

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<p>Solari, Stephen J., <u>Digital Video and Audio Compression</u>. New York: McGraw-Hill, 1997.</p> <p>Watkinson, John. <u>The Art of Digital Audio</u>. 2nd ed. Oxford: Focal Press, 1994.</p> <p>◆End</p>	